Latest Duke Study

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Pennsylvania Fracking Can Put Water At Risk, Duke Study Finds

By Mark Drajem - Jul 10, 2012 12:00 AM ET

A study that found hydraulic fracturing for natural gas puts drinking-water supplies inPennsylvania at risk of contamination may renew a long-running debate between industry and activists.

The report by researchers at Duke University, published yesterday in the Proceedings of theNational Academy of Sciences, said a chemical analysis of 426 shallow groundwater samples found matches with brine found in rock more than one mile (1.2 kilometers) deep, suggesting paths that would let gas or water flow up after drilling. While the flows weren't linked to hydraulic fracturing, or fracking, the study found natural routes for seepage into wells or streams.

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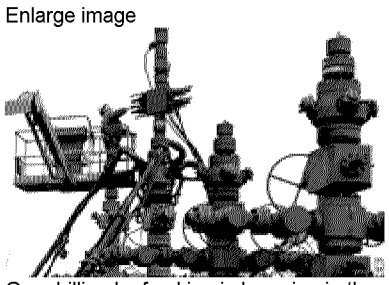

Gas drilling by fracking is booming in the Marcellus gas field, mainly in Pennsylvania, with permits issued for more than 11,000 wells mostly in the northeastern counties, such as Bradford and Susquehanna, studied by the scientists. Photo: Julia Schmalz/Bloomberg

"The industry has always claimed that this is a separation zone, and there is no way fluids could flow" from the shale to the aquifers, Avner Vengosh, a professor at the Nicholas School of the Environment at Duke University and one of the study's eight authors, said in an interview. "We see evidence of hydrologic connectivity."

Gas drilling by fracking is booming in the Marcellus gas field, mainly in Pennsylvania, with permits issued for more than 11,000 wells mostly in the northeastern counties, such as Bradford and Susquehanna, studied by the scientists. The drilling has been an economic boon for the state and helped drive down natural gas prices nationwide to decade lows.

It has also raised fears among citizens and environmental groups about water contamination from the chemical mixture used to break apart the shale or from gas leaking into water wells.

Dimock Tests

The town of Dimock, where some residents say water turned toxic after gas-drilling nearby, is in Susquehanna County. The U.S. Environmental Protection Agency tested water in Dimock, and found none with unsafe levels of contaminants.

"We have not seen any evidence that hydraulic fracturing has contaminated groundwater in Pennsylvania," said Kevin Sunday, a spokesman for Pennsylvania's Department of Environmental Protection, in an e-mail.

In fracking, water, sand and chemicals are injected into deep shale formations to crack the rock and free trapped gas. The Marcellus formation, stretching from New York to Tennessee, may hold enough gas to supply the U.S. for three years.

Gas is likely to leak up from the shale formation first, before water or drilling fluids, Vengosh said. The study found that the minerals in shallow wells flowed there naturally, over time, and didn't find a connection between gas drilling and water contamination.

'No Correlation'

Industry representatives said that was the most important finding.

"The good news is that the researchers make it crystal clear that the phenomena they observed had nothing to do with shale development," Chris Tucker, a spokesman for the industry- backed group Energy In Depth in Washington, said in an e-mail.

Still, some of the homes tested are "at higher risk" of contamination due to underlying geology, Nathaniel Warner, the lead author on the Duke study, said in a statement.

The results show that "these areas could be at greater risk of contamination from shale-gas development because of a pre-existing network of cross-formational pathways that has enhanced hydraulic connectivity to deeper geological formations," according to the study.

Terry Engelder, a professor of geosciences at Pennsylvania State University who studies geological formations in the region, reviewed the Duke paper and recommended against publication in the journal, he said.

"The science on this paper is solid," he said in an interview. "It's the leap of faith they take in their interpretation and to focus everybody's attention on the Marcellus" gas drilling.

It's not clear how long it took for the brine to migrate into groundwater, and it could take thousands of years, he said. And once fracking takes place, gas and water will flow into the well and not up through any fissures that may exist. "The natural flow would be into the well bore," Engelder said.

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